

SCRIVER WOODS HOMEOWNERS ASSOCIATION (PWS 4080034) SOURCE WATER ASSESSMENT FINAL REPORT

December 26, 2002



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Scriver Woods Homeowners Association, Crouch, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Scriver Woods Homeowners Association (PWS #4080034) drinking water system consists of four well sources, Well #1, Well #2, Well #3, and Well #4. The system is located near Crouch, Idaho, and serves approximately 75 people through 25 connections.

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in another category results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

In terms of total susceptibility, Well #1 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity scores were both rated high, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbial bacteria. The automatically high rating is due to the fire station and a drainage ditch that exists within 50 feet of the well (Ground Water Under Direct Influence (GWUDI) field survey, 1998) and the detection of the IOC fluoride above the maximum contaminant level (MCL) of 4.0 milligrams per liter (mg/L) as set by the EPA. If a spill or release occurred at the fire station or into the ditch up-gradient of the well, contaminants could potentially contaminate the well. A well log was not available for Well #1, and assessment scores derived from it were conservative resulting in a high rating. If a well log had been available, the final scores might have been lower.

In terms of total susceptibility, Well #2 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity scores were both rated high, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbial bacteria. The automatically high rating is due to the fire station and a drainage ditch existing within 50 feet of the well (GWUDI field survey, 1998) and a detection of the IOC fluoride above the MCL set by the EPA. If a spill or release occurred at the fire station or into the ditch up-gradient of the well, contaminants could potentially contaminate the well. A well log was not available for Well #2, and intermediate scores derived from the assessment resulted in the source being given the most conservative, highest score. If a well log had been available, scores might have been lower.

In terms of total susceptibility, Well #3 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity scores were both rated high, and land use rated low for IOCs, VOCs, SOCs, and microbial bacteria. The automatically high rating is due to a dirt road and driveway that existing within 50 feet of the well (GWUDI field survey, 1998). If a spill or release occurred on these access roads contaminants could potentially contaminate the well. If not for the automatic ratings, Well #3 would have rated moderate for IOCs, VOCs, SOCs, and microbials.

In terms of total susceptibility, Well #4 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction rated high, hydrologic sensitivity rated moderate, and land use rated low for IOCs, VOCs, SOCs, and microbial bacteria. The automatically high rating is due to a dirt road existing within 50 feet of the well (GWUDI field survey, 1998). If a spill or release occurred on the road contaminants could potentially contaminate the well. If not for the automatic ratings, Well #4 would have rated moderate for IOCs, VOCs, SOCs, and microbials.

No VOCs, SOCs, or microbials have ever been tested in the wells. The IOCs barium, copper, cadmium, nitrate, nickel, and fluoride have been detected in tested water. All of the IOCs have been detected in concentrations significantly below their MCLs except for fluoride. Fluoride detections have occurred as high as 12.1 mg/L in Well #1 (March 1995) and 10 mg/L in Well #2 (March 1995), significantly higher than it's MCL of 4 mg/L. Trace amounts of natural radiation have been detected in the wells.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Scriver Woods Homeowners Association, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Actions should be taken to keep a 50-foot radius circle clear of potential contaminants from around both wellheads. As there are subdivision roads up-gradient of the wells, any contaminant spill associated with the roads should be carefully monitored and dealt with. As much of the designated assessment areas are outside the direct jurisdiction of Scriver Woods Homeowners Association, collaboration and partnerships with state and local agencies and industry groups are critical to the success of drinking water protection. The wells should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation contains some residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR SCRIVER WOODS HOMEOWNERS ASSOCIATION, CROUCH, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this assessment means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are included. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Scriver Woods Homeowners Association (PWS #4080034) drinking water system consists of four well sources, Well #1, Well #2, Well #3, and Well #4. The system is located near Crouch, Idaho, and serves approximately 75 people through 25 connections (Figure 1).

No VOCs, SOCs, or microbials have ever been tested in the wells. The IOCs barium, copper, cadmium, nitrate, nickel, and fluoride have been detected in tested water. All of the IOCs have been detected in concentrations significantly below their MCLs except for fluoride. Fluoride detections have occurred as high as 12.1 mg/L in Well #1 (March 1995) and 10 mg/L in Well #2 (March 1995), significantly higher than its MCL of 4 mg/L. Trace amounts of natural radiation have been detected in the wells.

Defining the Zones of Contribution – Delineation

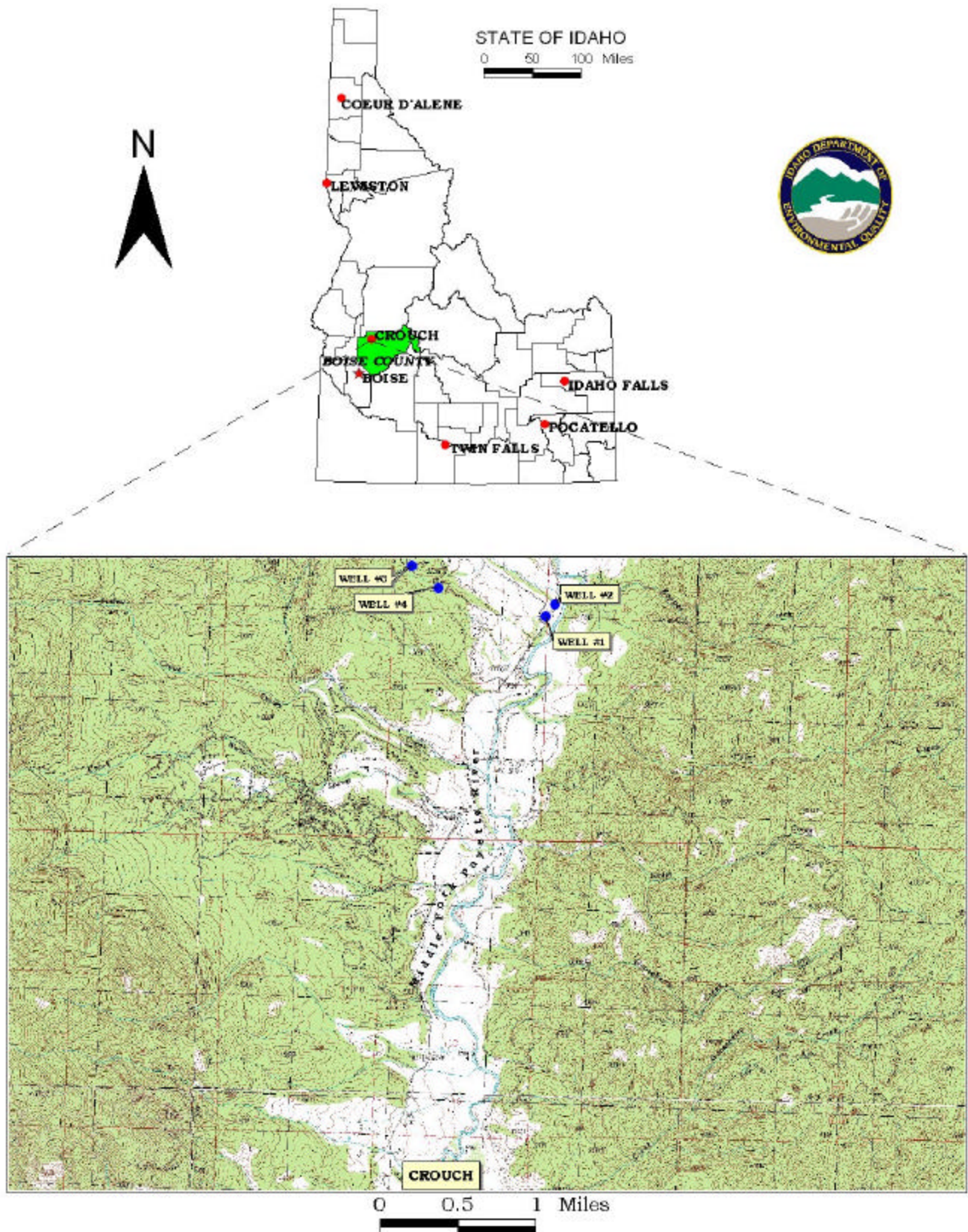
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ developed the delineation using a refined analytical element computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT. The computer model used site specific data, assimilated by DEQ from a variety of sources including the Scriver Woods Homeowners Association well logs, other local area well logs, and hydrogeologic reports (detailed below).

General Geology for the Garden Valley aquifer system

The Garden Valley province lies in the western portion of the Idaho Batholith, a large granitic mass that underlies much of central Idaho. Northeast-trending faults occur in the granite throughout the area. The western side of the valley is cut by a large north-south trending fault that appears to be an extension of the Boise Ridge Fault (Scanlon, 1996). Garden Valley is considered a structural basin produced by Tertiary faulting (Weis, 1994). Geologic materials underlying surficial soils consist of alluvial sandy gravel with cobbles deposited by the Middle Fork of the Payette River (Fisher et al., 1992). The Payette Formation, composed of poorly consolidated siltstone and sandstone occurs along the west side of the river.

Based on existing information, including well logs, topography, and technical reports, the regional static ground water level occurs at a depth of 0 (surficial springs) to about 60 feet below ground surface (bgs) in the alluvium and up to 220 feet bgs for wells drilled in the granite. Well log specific capacity tests produce aquifer transmissivities from 4 to 265 ft²/day. A nutrient pathogen study conducted for the Cross Timber Ranch Subdivision (Terracon, 1999) in the vicinity of Alder Creek on the south side of Garden Valley. A slug test on one of the monitoring wells predicted a saturated hydraulic conductivity value of 9 feet per day for the alluvial aquifer, in line with the specific capacity tests performed. An additional nutrient-pathogen study for the River Park Meadows Subdivision (Braun, 2000) located at the northern boundary of the model showed similar conditions in the area.

FIGURE 1. Geographic Location of Scriver Woods Homeowners Association



Precipitation in Garden Valley, at an elevation of about 3100 feet above seam level, has averaged about 24 inches per year from 1917 to 1995, with most precipitation occurring from November through March. The temperature during these months ranges from 25.9 °F to 37.9 °F (www.worldclimate.com). Discharge is measured in Garden Valley at the Middle Fork of the Payette River near Crouch (USGS Station 13237920). Only data recorded from October 1999 through September 2001 was available <http://waterdata.usgs.gov/id>, with the April and May flow averaging about 700 cubic feet per second (cfs), and the August through September flow averaging about 90 cfs.

Despite the large quantities of water in the valley, recharge was kept quite low (0 to 0.40 inches per year) since the major rock type is granite.

Delineation Methodology

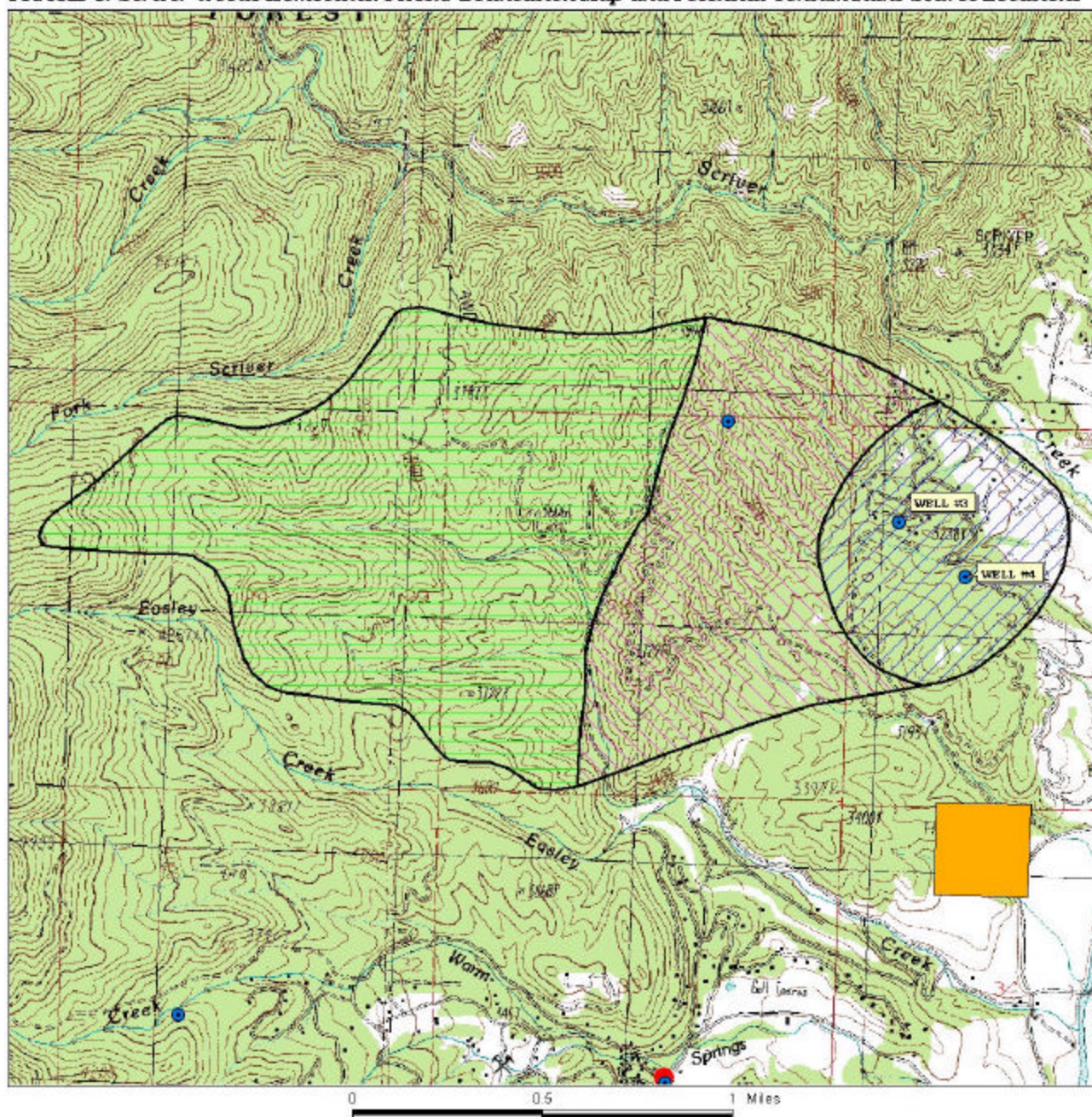
The two wells of the Garden Valley Ranchettes (4080018), the two wells of Garden Valley High School (4080017), and Scriver Woods wells #1 and #2 (4080034) have delineations that do not come into contact with any of the influential fault zones bounding the valley. These six wells were modeled simultaneously to take into account well interference.

The Scriver Woods wells' delineation crosses under the Middle Fork of the Payette River. The western extent of the delineation underlies the area of Scriver Woods wells #3 and #4 locations and comes within about 1 mile of the approximate location of a bounding fault. Possibly wells #1 and #2 could not get enough water from the western fault zone because of the interference from wells #3 and #4.

During the WhAEM2000 (Kraemer, 2000) simulations, a number of wells located to the east of the mapped fault line had capture zones that intersected the fault line boundary. When this occurred, the additional TOTs were covered using a topographic watershed delineation for that portion of the fault zone that was crossed. The Scriver Wood wells #3 and #4, the Valley High Estates wells #1 and #2, and the Mountain View wells #1 and #2 each reached the western fault boundary after about 6 years of travel time. Therefore, in each case, the 10-year TOT became a topographic watershed delineation.

The delineated source water assessment area for the Scriver Woods Homeowners Association wells consists of two delineations. Well #1 and Well #2's delineation is a northwest-southeast trending corridor approximately 2 miles long and 0.75 miles wide (Figure 2). Well #3 and Well #4's delineation extends approximately 2.25 miles to the west, and is up to 1.5 miles wide (Figure 3). The actual data used by DEQ in determining the source water assessment delineation areas are available from DEQ upon request.

FIGURE 3. Scriber Woods Homeowners Assn. Delineation Map and Potential Contaminant Source Locations



PWS# 4080034
WELL #3 & #4

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the area surrounding the Scriver Woods Homeowners Association wells' delineations is mostly national forest, however, a subdivision is being built within the immediate vicinity. In addition, the Middle Fork Payette River and Middle Fork Road intersect Well #1 and Well #2's delineation.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in June and July 2002. The first phase involved identifying and documenting potential contaminant sources within the Scriver Woods Homeowners Association source water assessment areas (Figure 2 and 3) through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the delineated areas.

The delineated source water area for both wells does not include any identified potential contaminant point sources. However, there are roads, a fire station, and a drainage ditch within the 50-foot sanitary setbacks of at least one of the wells, which resulted in automatically high overall ratings for IOCs, VOCs, SOC, and microbials. The Middle Fork Road and Middle Fork Payette River also intersected the delineation for Well #3 and Well #4. The secondary streams and the subdivision roads were also considered in the ratings.

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination

Hydrologic sensitivity rated high for Well #1, Well #2, and Well #3, and moderate for Well #4 (Table 1). The National Resource Conservation Service (NRCS) rated soils surrounding the wells as moderately to well drained. The vadose composition for Well #1, Well #2, and Well #3 is unknown due to either a missing well log or missing information on the well logs. The vadose zone associated with Well #4's is composed predominantly of clay. In each of the wells, the depth to the water table is less than 300 feet or unknown. Presence of an aquitard is unknown in Well #1 and Well #2 due to missing well logs, unknown in Well #3 due to no water table depth on the well log, and present in Well #4.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey was conducted in 1997.

Well #1 rated high for system construction (Table 1). No well log was available during this analysis, however the following information was derived from the 1999 Sanitary Survey. The well was constructed in 1983 and the six-inch well is 92 feet deep. A screened vent 18 inches tall is present, however it is not down-turned. Static water level, depth of surface seal, screened intervals, and casing thickness are unknown, and no wellhead seal is present. The well is located outside of a 100-year floodplain. As the well is only 92 feet deep, the highest production comes from less than 100 feet below static water depths.

Well #2 rated high for system construction. No well log was available for this well, and the 1999 Sanitary Survey supplied the only information that contributed to the rating. According to the sanitary survey, this 6-inch well is located on a lot that is not adequate, and in a wellhouse that is not considered maintained. In addition, the sanitary survey noted that a wellhead seal and proper well vent are not present. Since no well log was available it is unknown if the casing and annular seal extend into low permeability units, or if the highest production comes from more than 100 feet below static water depths. The well is located outside of the 100-year floodplain, positively affecting the score.

Well #3 rated high for system construction. The well log and the 1999 Sanitary Survey provided the following information. A 6-inch diameter, 0.25 inch thick steel casing was placed to 243 feet below ground surface (bgs), into decomposed granite. Factory cut perforations were placed between 120 feet bgs and 240 feet bgs, and are within a unit of decomposed granite. An annular seal was placed to 18 feet bgs into a topsoil/clay unit. The score was derived from a wellhead that is not safe from flooding due to the absence of a downturned vent. A vent is important, because without one, as the water level is drawn down during pumping, a vacuum is created. The vacuum creates a suction which reduces the pump's efficiency, and could draw contamination into the well through cracks, or cause the well to slough. A proper vent will be downturned to prevent surface water from entering the well and screened to keep insects, dust, and rodents from entering into the well's casing. The annular seal extends into a low permeability unit, however the casing does not (decomposing granite). The well log did not have any information regarding water table depth, so it is unknown if the highest production comes from more than 100 feet below the water table. The well is located outside of the 100-year floodplain.

Well #4 rated high for construction. The 247-foot deep well is constructed of a 6-inch diameter 0.250-inch thick casing which is seated into sand with clay streaks. Torch-cut perforations exist between 107 feet bgs and 247 bgs. The water table was measured at 140 feet bgs and a bentonite annular seal extends 20 feet bgs into a decomposing granite layer. Positively affecting the score is the fact that the well is located outside of the 100-year floodplain and the casing is seated into an impermeable unit. The high rating is a result of the casing thickness not meeting current regulations, an annular seal which is not seated into an impermeable unit, and highest productions of water coming from less than 100 feet below static water depths.

Current PWS well construction standards are more stringent than when the wells were constructed. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the regulations deal with screening requirements, aquifer pump tests, use of a downturned casing vent, and thickness of casing. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Well casings 8 inches in diameter require a thickness of 0.322-inches and casings 6 inches in

diameter require a casing thickness of 0.280-inches. While the wells may have been in compliance with well construction standards at the time they were drilled, the wells are not compliant under current standards, and as a result, one point was added to the system construction scores.

Potential Contaminant Source and Land Use

Well #1 and Well #2 both rated moderate for IOCs (i.e. nitrates, fluoride), VOCs (i.e. petroleum products), SOC (i.e. pesticides), and low for microbial contaminants (i.e. bacteria). Well #3 and Well #4 rated low for all four potential contaminant types. Besides the potential contaminant sources within the 50 foot sanitary setback distances of the well, Middle Fork Road, the Middle Fork Payette River, the secondary streams, and subdivision roads are potential contaminant sources which could contribute leachable contaminants to the groundwater if a release occurred.

Final Susceptibility Ranking

A detection above a drinking water standard MCL, any detection of a VOC or SOC, or a confirmed detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, potential contaminant sources within 50 feet of a wellhead will automatically lead to a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) contribute greatly to the overall ranking. In this case, all four wells rated automatically high for all potential contaminant sources due to infringements upon the sanitary setback of the wells. In addition, Well #1 and Well #2 rated automatically high due to detections of fluoride above MCLs.

Table 1. Summary of Scriver Woods Homeowners Association Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	M	M	M	L	H	H*^	H*	H*	H*
Well #2	H	M	M	M	L	H	H*^	H*	H*	H*
Well #3	H	L	L	L	L	H	H*	H*	H*	H*
Well #4	M	L	L	L	L	H	H*	H*	H*	H*

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

H^{*} = automatically high rating due to infringements within the 50 foot sanitary setback distance

H[^] = automatic high for IOCs due to fluoride detections above maximum contaminant levels (MCLs)

Susceptibility Summary

In terms of total susceptibility, Well #1 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity scores were both rated high, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbial bacteria. The automatically high rating is due to the fire station and a drainage ditch existing within 50 feet of the well (GWUDI, 1998) and a detection of the IOC fluoride above its MCL set by the EPA. If a spill or release occurred at the fire station or into the ditch up-gradient of the well, contaminants could potentially contaminate the well. A well log was not available for Well #1, and intermediate assessment scores derived were conservative resulting in the high score. If a well log had been available, scores might have been lower.

In terms of total susceptibility, Well #2 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity scores were both rated high, and land use rated moderate for IOCs, VOCs, SOCs, and low for microbial bacteria. The automatically high rating is due to the fire station and a drainage ditch existing within 50 feet of the well (GWUDI field survey, 1998) and a detection of the IOC fluoride above its MCL set by the EPA. If a spill or release occurred at the fire station or into the ditch up-gradient of the well, contaminants could potentially contaminate the well. A well log was not available for Well #2, and intermediate assessment scores were conservative resulting in the high score. If a well log had been available, scores might have been lower.

In terms of total susceptibility, Well #3 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction and hydrologic sensitivity scores were both rated high, and land use rated low for IOCs, VOCs, SOCs, and microbial bacteria. The automatically high rating is due to a dirt road and a driveway existing within 50 feet of the well (GWUDI field survey, 1998). If a spill or release occurred on these access roads contaminants could potentially contaminate the well. If not for the automatic ratings, Well #3 would have rated moderate for IOCs, VOCs, SOCs, and microbials.

In terms of total susceptibility, Well #4 rated automatically high for IOCs, VOCs, SOCs, and microbials. System construction rated high, hydrologic sensitivity rated moderate, and land use rated low for IOCs, VOCs, SOCs, and microbial bacteria. The automatically high rating is due to a dirt road existing within 50 feet of the well (GWUDI field survey, 1998). If a spill or release occurred on the road contaminants could potentially contaminate the well. If not for the automatic ratings, Well #4 would have rated moderate for IOCs, VOCs, SOCs, and microbials.

No VOCs, SOCs, or microbials have ever been tested in the wells. The IOCs barium, copper, cadmium, nitrate, nickel, and fluoride have been detected in tested water. All of the IOCs have been detected in concentrations significantly below their MCLs except for fluoride. Fluoride detections have occurred as high as 12.1 mg/L in Well #1 (March 1995) and 10 mg/L in Well #2 (March 1995), significantly higher than its MCL of 4 mg/L. Trace amounts of natural radiation have been detected in the wells.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Scriver Woods Homeowners Association, drinking water protection activities should first focus on correcting any deficiencies outlined in the sanitary survey. Actions should be taken to keep a 50-foot radius circle clear around the wellheads. Any spills within the delineations should be carefully monitored and dealt with. As much of the designated protection area is outside the direct jurisdiction of Scriver Woods Homeowners Association, making collaboration and partnerships with state and local agencies and industry groups are critical to the success of drinking water protection. The well should maintain sanitary standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation contains some urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Boise County Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Boise Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office (208) 373-0550

State DEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mlharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

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Idaho Department of Environmental Quality, 1995. Groundwater Under Direct Influence (GWUDI) Field Survey Report.

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Kraemer, S.R., H.M. Haitjema, and V.A. Kelson, 2000, Working with WhAEM2000 Source Water Assessment for a Glacial Outwash Well Field, Vincennes, Indiana, U.S. Environmental Protection Agency, Office of Research, EPA/600/R-00/022, 50 p.

Terracon, 1999, Nutrient-Pathogen Study Crosstimber Ranch Subdivision, Boise County, Idaho, Project No. 62997001.

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www.waterdata.usgs.gov/id

www.worldclimate.com

Attachment A

Scriver Woods Homeowners Association Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

1. System Construction

SCORE

Drill Date	01/01/1983	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	1999
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
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Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	3	3	3	3
(Score = # Sources X 2) 8 Points Maximum		6	6	6	6
Sources of Class II or III leacheable contaminants or	YES	3	3	3	
4 Points Maximum		3	3	3	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0

Total Potential Contaminant Source / Land Use Score - Zone 1B 9 9 9 6

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	

Potential Contaminant Source / Land Use Score - Zone II 3 3 3 0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	

Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2 0

Cumulative Potential Contaminant / Land Use Score	14	14	14	6
4. Final Susceptibility Source Score	14	14	14	13
5. Final Well Ranking	High	High	High	High

1. System Construction

SCORE

Drill Date	06/01/1978	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	1999
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score VOC Score SOC Score Microbial Score

Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	3	3	3	3
(Score = # Sources X 2) 8 Points Maximum		6	6	6	6
Sources of Class II or III leacheable contaminants or	YES	3	3	3	
4 Points Maximum		3	3	3	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0

Total Potential Contaminant Source / Land Use Score - Zone 1B 9 9 9 6

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	

Potential Contaminant Source / Land Use Score - Zone II 3 3 3 0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	

Total Potential Contaminant Source / Land Use Score - Zone III 2 2 2 0

Cumulative Potential Contaminant / Land Use Score	14	14	14	6
4. Final Susceptibility Source Score	14	14	14	13
5. Final Well Ranking	High	High	High	High

1. System Construction

SCORE

Drill Date	06/01/1978	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1999
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score VOC Score SOC Score Microbial Score

Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0

Total Potential Contaminant Source / Land Use Score - Zone 1B 0 0 0 0

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	

Potential Contaminant Source / Land Use Score - Zone II 0 0 0 0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	

Total Potential Contaminant Source / Land Use Score - Zone III 0 0 0 0

Cumulative Potential Contaminant / Land Use Score	0	0	0	0
4. Final Susceptibility Source Score	11	11	11	11
5. Final Well Ranking	High	High	High	High

1. System Construction

SCORE

Drill Date	02/02/1994	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1999
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0

Total System Construction Score 5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	NO	0
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0

Total Hydrologic Score 3

3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
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Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0

Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or	NO	1	1	1	
4 Points Maximum		1	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0

Total Potential Contaminant Source / Land Use Score - Zone 1B 3 3 3 2

Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	

Potential Contaminant Source / Land Use Score - Zone II 0 0 0 0

Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	

Total Potential Contaminant Source / Land Use Score - Zone III 0 0 0 0

Cumulative Potential Contaminant / Land Use Score	3	3	3	2
4. Final Susceptibility Source Score	9	9	9	8
5. Final Well Ranking	High	High	High	High